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CLAIMS

1. A method for producing non grain-oriented magnetic steel sheets in which hot strip is produced from an input stock such as cast slabs, strip, roughed strip, or thin slabs, made of steel comprising (in weight %)

C: 0.001 - 0.05 %

Si: ≤ 1.5 %

Al: ≤ 0.4 %

with $Si + 2Al \leq 1.7$ %

Mn: 0.1 - 1.2 %

if necessary up to a total of 1.5 % of alloying additions such as P, Sn, Sb, Zr, V, Ti, N, Ni, Co, Nb and/or B;

with the remainder being iron as well as the usual accompanying elements

in that the input stock is hot-rolled directly from the casting heat or after preceding reheating to a reheating temperature between min. 1000 °C and max. 1180 °C in several deformation passes, and subsequently coiled, wherein during hot-rolling at least the first deformation pass takes place in the austenitic region and at least one further deformation pass takes place in the two-phase mixing region austenite / ferrite, and wherein during rolling in the two-phase mixing region a total deformation ϵ_h of at least 35 % is achieved.

Self
Al 2.

The method according to one of the preceding claims, characterised in that the total deformation ϵ_h is 60 % max.

3. The method according to claim 1 or 2, characterised in that the hot strip after deformation in the austenitic region is finish rolled exclusively in the two-phase mixing region austenite / ferrite.
4. The method according to one of the preceding claims, characterised in that the total deformation ϵ_h achieved during rolling in the two-phase mixing region austenite / ferrite is at least 50 %.
5. The method according to claim 1, characterised in that following rolling in the two-phase mixing region austenite / ferrite, at least one deformation pass is carried out in the ferritic region.
6. The method according to claim 5, characterised in that the total deformation ϵ_h achieved during rolling in the ferritic region is at least 10 % and at most 33 %.
7. The method according to one of the preceding claims, characterised in that the coiling temperature is at least 700 °C.
8. The method according to claim 7, characterised in that the coiled hot strip from the coiling heat is subjected to direct annealing and that the annealing time at an annealing temperature exceeding 700 °C is at least 15 minutes.

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9. The method according to claim 6,
characterised in that the steel has an Si content of
at least 0.7 weight %.
10. The method according to one of the preceding claims,
characterised in that the coiling temperature is
less than 600 °C, in particular less than 550 °C.
11. The method according to claim 9 or 10,
characterised in that immediately following coiling,
the hot strip is subjected to accelerated cooling in
the coil.
12. The method according to one of the preceding claims,
characterised in that during hot-rolling in the
ferritic region, at least one deformation pass is
carried out with the use of lubricant.
13. The method according to claim 12,
characterised in that all deformation passes taking
place in the ferritic region are carried out with
roll lubrication.
14. The method according to one of the preceding claims,
characterised in that after coiling, the hot strip
is annealed at an annealing temperature of at least
740 °C.
15. The method according to claim 14,
characterised in that annealing of the coiled hot
strip is carried out in a batch-type annealing
furnace.

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16. The method according to claim 14,
characterised in that annealing is carried out in a
continuous furnace.
17. The method according to one of the preceding claims,
characterised in that the thickness of the hot coil
is ≤ 1.5 mm.
18. The method according to one of the preceding claims,
characterised in that the hot strip is prepared for
processing and supplied as magnetic steel sheets.
19. The method according to claim 18,
characterised in that prior to preparation for
processing and delivery, the hot strip is planished
at a degree of deformation of ≤ 3 %.
20. The method according to claim 18,
characterised in that prior to preparation for
processing and delivery, the hot strip is temper-
rolled at a degree of deformation of $> 3 - 15$ %.
21. The method according to one of claims 18 to 20,
characterised in that prior to preparation for
processing and delivery, the hot strip is subjected
to final annealing, at an annealing temperature of > 740 °C.
22. The method according to one of claims 18 to 20,
characterised in that prior to preparation for
processing and delivery, the hot strip undergoes
recrystallising annealing at annealing temperatures
 > 650 °C to form a magnetic steel strip which has
not been subjected to final annealing.

23. The method according to one of claims 1 to 16, characterised in that the hot strip is cold-rolled in single-stage or multi-stage rolling, to a final thickness.

24. The method according to claim 23,
characterised in that cold-rolling is carried out in
several stages and that at least one of the cold-
rolling stages is followed by intermediate
annealing.

25. The method according to one of claims 23 or 24, characterised in that following cold-rolling, the cold strip is subjected to final annealing at an annealing temperature of $> 740^{\circ}\text{C}$.

26. The method according to one of claims 23 or 24, characterised in that following cold-rolling, the cold strip is subjected to recrystallising annealing in a batch-type annealing furnace or in a continuous furnace at annealing temperatures of at least 650 °C to form a magnetic steel strip which has not been subjected to final annealing; with the cold strip subsequently being levelled and rerolled.

27. The method according to one of claims 21, 22, 25 or 26, characterised in that annealing is carried out in a decarburising atmosphere.